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10/514,411

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EXAMINER

JOHNSON, CONNIE P

ART UNIT

PAPER NUMBER

1752

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/514,411	Applicant(s) YAMADA ET AL.	
	Examiner Connie P. Johnson	Art Unit 1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

1. The remarks and amendment filed 3/1/2007 has been entered and fully considered.
2. Claims 1-14 are presented.
3. Claim 1 is amended.
4. Claim 14 is new for examination.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemiya et al., U.S. Patent No. 6,372,351 B1 in view of Mori et al., U.S. Patent No. 6,399,270 B1.

Takemiya teaches a resin composition comprising an epoxy resin, a non-conductive carbon and an inorganic filler (col. 2, lines 44-47). The resin composition is photosensitive because the composition is exposed to laser light (see column 14, lines 65-67). The epoxy resin, acrylic resins and fluorine resins meet the limitations of thermoplastic and solvent-soluble resins. Table 1, example 1 discloses the epoxy resins in an amount of 100 parts by weight and an arylakyl phenolic resin in an amount of 87

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parts by weight in the composition. The composition further comprises a coupling agent (organic compound) such as vinyltriethoxysilane and meets the limitations of a polymerizable unsaturated group per molecule. The inorganic filler may comprise powders of fused silica, alumina and zirconia. The inorganic filler may also comprise a spherical particle shape (col. 9, lines 15-28). The composition may comprise a non-conductive carbon material (carbon black covered with an insulating, inorganic material such as silica) and having an average particle diameter of 0.3 to 5  $\mu\text{m}$  (col. 8, line 59), surface area of 130  $\text{m}^2/\text{g}$  or smaller, and a DBP oil absorption of 120  $\text{cm}^3/100\text{g}$  (120  $\text{ml}/100\text{g}$ ) or less (col. 10, lines 34-40). Since the non-conductive carbon material has an average particle diameter of 0.3 to 5  $\mu\text{m}$ , it also would have a pore volume of 0.1  $\text{ml}/\text{g}$  to 10  $\text{ml}/\text{g}$ . Takemiya teaches that there are no limitations on the carbon black used in the carbon-included filler. Therefore the inorganic porous material is exemplified in the carbon-included filler obtained by covering particle surfaces of carbon black with insulating inorganic matter, such as silica (see col. 7, lines 30-35). Takemiya does not teach an organic compound with a molecular weight of 400 to 1,000 in the photosensitive composition.

However, Mori teaches a printing plate comprising a component layer with inorganic porous particles (col. 6, lines 34-43). The component layer also comprises a plastic resin and an organic compound (col. 43, line 39). The plastic resin may comprise thermally fusible materials, such as novolac and acryl resins that have a softening point of 50 to 200 $^{\circ}\text{C}$  (col. 13, line 54 and col. 14, line 15). The plastic resins in the printing plate may further comprise a solvent-soluble resin, such as a polyimide resin (col. 11,

line 57). The organic compound has a molecular weight of 400 to 1,000 and is present in an amount of 5 to 70% of the photosensitive layer, therefore is present at least in an amount equivalent to 5 to 200 parts by weight of the resin (col.44, line 51-56). This compound meets the limitation of the present claimed organic compound in instant claim 1. The organic compound also meets the limitations of instant claim 4. It would have been obvious to one of ordinary skill in the art to add an organic compound with the molecular weight of 400 to 1,000 to the photosensitive composition of Mori because Mori teaches a photosensitive composition with the same components in the same parts by weight, therefore the organic compound would have a molecular weight in the claimed range. Claim 8 is drawn to a photosensitive resin of claim 1, as such the intended use is not a patentable limitation.

7. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemiya et al., U.S. Patent No. 6,372,351 B1 in view of Mori et al., U.S. Patent No. 6,399,270 B1 as applied to claim 1 above and further in view of Cushner et al., U.S. Patent No. 5,798,202.

Takemiya teaches a resin composition comprising an epoxy resin, a non-conductive carbon and an inorganic filler (col. 2, lines 44-47). The resin composition is photosensitive because the composition is exposed to laser light (see column 14, lines 65-67). Takemiya does not teach a laser engraveable printing element.

However, Cushner teaches a laser engraveable printing plate. Although Cushner teaches that the printing plate has a single layer, the single layer is produced by a

building up of multiple layers of the same composition (col. 2, lines 54-59). The elastomeric layer is formed into a flat sheet by wrapping the element around a cylindrical form (col. 3, lines 15-20). The elastomeric material is subjected to thermochemical reinforcement (crosslinking by heat exposure) using a crosslinker to form an elastomeric layer for laser engraving (col. 3, lines 46-54). Cushner also teaches that the printing element has a coversheet (printing element layer). Example 1 shows a laser engraveable elastomeric layer with a shore hardness of 32.3 as in instant claim 10. Cushner does not specifically teach that the elastomers used are in a liquid state at 20°C, however it would have been obvious to one of ordinary skill in the art to use a liquid elastomer to have a more flexible and durable elastomer for the laser engraving process. In column 5, lines 30-55, Cushner teaches photochemical reinforcement of the elastomer layer by using photohardening materials in the elastomer layer and exposing it with actinic radiation. Claim 9 is a product by process claim. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (see MPEP 2113). It would have been obvious to one of ordinary skill in the art to use the photosensitive resin material of Takemiya in the laser engraveable printing element of Cushner because Cushner

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teaches photosensitive material in the elastomeric layer of the printing element to absorb the laser radiation.

8. Claims 1, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kannurpatti et al., EP 1215044 A2.

Kannurpatti teaches a method for forming a laser engraveable printing element. The printing element comprises an elastomeric layer. The elastomeric layer comprises monomers with a molecular weight of less than 30,000 (component a) (page 4, [0018]). The printing element may also comprise an addition-polymerization ethylenically unsaturated compound with a molecular weight of less than 5,000 (component b) (page 4, [0018]). Kannurpatti teaches that the printing element comprises an elastomeric resin, such as Kraton 1102 (see page 7, table 1 and page 5, [0015]). The elastomeric layer also comprises an inorganic filler with a particle size of less than 1  $\mu\text{m}$  (component c) (page 5, [0022]). The inorganic porous material is preferably zirconium silicate and amorphous silica as exemplified in examples 1 and 2, respectively. Kannurpatti does not specifically teach that the elastomeric resin used is in a solid state at 20°C, however it would have been obvious to one of ordinary skill in the art to use a solid elastomer to have a more flexible and durable elastomer for the laser engraving process. Kannurpatti does not specifically teach that the zirconium silicate and amorphous silica have a pore volume and pore diameter as claimed. However, it would have been obvious to one of ordinary skill in the art that zirconium silicate and amorphous silica would have a pore diameter and pore volume as claimed because these compounds are disclosed as

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suitable inorganic porous material for the photosensitive composition and would provide the solubility required for an effective elastomeric layer for the laser engravable element. Kannurpatti also teaches that the method for forming the printing element comprises mounting the printing element onto a drum and exposed to laser light (page 7, [0034]). A relief depth is formed in the areas exposed to laser light. The printing element is exposed to UV radiation to effect photohardening. The composition also comprises a photopolymerization initiator to crosslink-cure the composition (see examples 1 and 2).

9. Claims 1, 2, 5-7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemiya et al., U.S. Patent No. 6,372,351 B1 in view of Mori (above) as applied to claim 1 above, in view of Watanabe et al., U.S. Patent Publication No. 2002/0045126 A1 and further in view of Mohr et al., U.S. Patent no. 5,851,649.

Takemiya teaches an epoxy resin composition comprising an epoxy resin, a non-conductive carbon and an inorganic filler (col. 2, lines 44-47). Takemiya does not teach the sphericity of the silica particles or polyhedral particles as in instant claim 6.

However, Watanabe teaches a photocurable composition comprising spherical silica particles. The spherical silica particles have a sphericity of 0.95 or more (page 5, [0056]). Watanabe also teaches a cationic polymerizable compound which is crosslinked and/or polymerized in the presence of a photoinitiator by irradiating with light as in instant claim 14 (photopolymerizable initiator) (page 2, [0020]). Therefore, it would have been obvious to one of ordinary skill in the art to use particles having a



sphericity amount as claimed because Watanabe shows the sphericity amount as conventional in photosensitive resins.

However, Mohr teaches inorganic porous particles, such as polyhedral crystals with a pore size distribution of smallest (10%) to largest (90%) sphere in the polyhedral particle ( $D_{10}/D_{90}$ ) is no more than 3 (abstract). According to figure 3 in the Mohr reference, the pore diameter of the particle is approximately 5-10nm (0.005-0.010 $\mu$ m). Therefore, it would have been obvious to one of ordinary skill in the art that the polyhedral particles having a  $D_{10}/D_{90}$  ratio of 3 would be expected to have a  $D_3/D_4$  ratio of 1 to 3 because the values are based on pore volume distribution and diameter.

### ***Response to Arguments***

10. Applicant's arguments, filed 3/1/2007, with respect to the rejection(s) of claim(s) 1-5 and 8-13 under 103(a) and claims 1-2 and 5-7 under 103(a) have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, new ground(s) of rejection are made herein.

11. Applicant argues that Takemiya does not teach a photocurable composition.

The composition of Takemiya comprises a photosensitive resin composition. The recitation, "wherein the photosensitive resin composition is capable of crosslink-curing by irradiation thereof with light or an electron beam," is functional language and adds no positive recitation to the claim. Further, Takemiya may use heat-curing for the photosensitive resin composition, but photocuring is contemplated because Takemiya

uses a laser on the printed package comprising the resin composition (see col. 15, lines 1-5). The resin composition is photosensitive and therefore use of a laser light to form the resin composition would be considered by one of ordinary skill.

12. Applicant argues that the photosensitive resin composition of Takemiya is not photocurable. Further, applicant cites the example of Takemiya, wherein a semiconductor device for evaluation was produced by transfer molding. The transfer molding was performed at 180<sup>0</sup>C, followed by post-curing at 175<sup>0</sup>C.

Applicant claims a photosensitive resin composition. The recitation, "wherein the photosensitive resin composition is capable of crosslink-curing by irradiation thereof with light or an electron beam," is functional language and adds no positive recitation to the claim.

13. Applicant argues that Takemiya does not teach or suggest an inorganic porous material with a specific surface area and DBP oil absorption value as claimed.

Applicant is directed to col. 7, lines 31-33, wherein Takemiya teaches non-conductive carbon as carbon black particles covered with an insulating, inorganic filler such as silica. The reference to column 10, lines 34-40 wherein Takemiya teaches the specific surface area and DBP oil absorption of conductive carbon particles is also applicable for the silica covered carbon black particles. The specific surface area, by

definition, is measured at the surface of the carbon black particles, not the surface of the insulating filler because the filler only covers (insulates) the carbon black particles to form a non-conductive environment. Further, the oil absorption value of the conductive carbon black particles is a measure of the ability of carbon black particles to absorb liquids. The property is a function of the structure of the carbon black only. Therefore, any insulating inorganic filler of the carbon black particles is not a factor in determining the DBP oil absorption of the carbon black particles. Both the specific surface area and the DBP oil absorption are properties of carbon black particles.

14. Applicant argues that Takemiya does not teach a photosensitive (photocurable) resin composition.

The composition of Takemiya is laser marked and comprises curing agents, curing accelerators and photosensitive dyes (col. 10, lines 20-34), therefore the composition is photosensitive.

15. Applicant argues that Mori does not teach a photosensitive resin composition that contains resin (a), organic compound (b) and inorganic porous material (c) of the instant invention. Further, applicant argues that there is no motivation to use an organic compound of Mori in the Takemiya reference because Mori does not teach components (a), (b) and (c) of instant claim 1 in the Mori reference.

The Mori reference teaches a photosensitive composition. Applicant is directed to column 22, lines 62-67, wherein Mori teaches a photosensitive image recording layer. In the component layer of the photosensitive composition, Mori teaches an inorganic porous material, an organic compound and a resin compound (see columns 9 and 10). Further, Mori does teach components (a), (b) and (c), with the inorganic porous material (c) having a pore volume as claimed (col. 6, lines 35-38). Therefore, it would have been obvious to one of ordinary skill to contemplate an inorganic porous material that not only has a pore volume of 0.1 to 10ml/g, but an average pore diameter of 1 to 1,000nm and an average particle diameter of not more than 10  $\mu$ m as claimed. The composition of Takemiya is photosensitive. The composition of Takemiya is laser marked and comprises curing agents, curing accelerators and photosensitive dyes (col. 10, lines 20-34), therefore the composition is photosensitive.

16. Applicant argues that Watanabe does not teach an inorganic porous material with a pore diameter as claimed. Further, Takemiya nor Watanabe teaches a photosensitive resin composition that is capable of crosslink-curing by irradiation thereof with a light or an electron beam.

The Watanabe reference is not used to reject the pore volume of the inorganic porous material. Watanabe teaches a photocurable composition comprising an inorganic porous material in the form of particles. Watanabe also teaches component (A) of the photocuring composition comprises a cationic polymerizable organic

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compound which is crosslinked and/or polymerized in the presence of a photoinitiator by irradiating with light (see page 2, [0020]). Watanabe also teaches spherical silica particles with a sphericity of 0.95 or more and an average particle diameter of 1-50 $\mu$ m (page 5, [0056]). The average particle diameter meets the limitations of the inorganic porous material with an average particle diameter of not more than 10 $\mu$ m as in instant claim 1. Although the terms "particle" and "pore" may not be the same, Watanabe teaches the sphericity and average particle size of an inorganic porous material. The sphericity of a material is related to the pore volume of the material. Therefore, one of ordinary skill in the art would contemplate that the inorganic particles would have a pore volume of 0.1 to 10ml/g as in instant claim 1.

As for the argument that Takemiya nor Watanabe teaches a photosensitive resin composition that is capable of crosslink-curing by irradiation thereof with a light or an electron beam, Watanabe is only used in the rejection of claims 1, 2, 5, 6 and 7. In addition, Takemiya does teach a photosensitive resin composition. The aforementioned claims are only drawn to a photosensitive resin composition. The limitation in instant claim 1, "wherein the photosensitive resin composition is capable of crosslink-curing by irradiation thereof with light or an electron beam," is a functional limitation and as such does not add positive recitation to the claim.

17. Applicant argues that Mohr does not teach a pore volume of the polyhedral particles nor that the particles have a  $D_3/D_4$  value of 1 to 3.

Figure 3 represents the pore volume distribution of polyhedral particles. Further, Mohr teaches an inorganic sintered body (inorganic porous particles) which are polyhedral crystals, having a ratio of  $D_{10}$  to  $D_{90}$  that is not more than 3. The inorganic sintered body is inorganic porous particles in the form of polyhedral particles. Mohri specifically teaches that the inorganic sintered body has pores that are formed by inorganic particles. Therefore, the inorganic sintered body is comprised of inorganic porous particles as claimed. Accordingly, figure 3 of Mohri shows that the  $D_3/D_4$  ratio would be expected to be 1 to 3. Even though figure 3 shows a pore volume distribution versus pore diameter, the graph clearly shows that the pore diameter is inversely proportional to the pore volume distribution. This correlation shows that polyhedral particles with a smaller diameter have a larger distribution in the inorganic porous material. For example, figure 3 shows that the polyhedral particles have a 100% pore volume distribution at a pore diameter of less than  $1\mu\text{m}$  (1,000nm). Therefore, the pore volume distribution is correlated to the pore diameter. The purpose of the graph taught by Mohri is to show the relationship between pore diameter and pore volume distribution.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Connie P. Johnson whose telephone number is 571-272-7758. The examiner can normally be reached on 7:30am-4:00pm Monday thru Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Connie P. Johnson  
Examiner  
Art Unit 1752

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